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SMILES' HOLE CUTTING MACHINE.

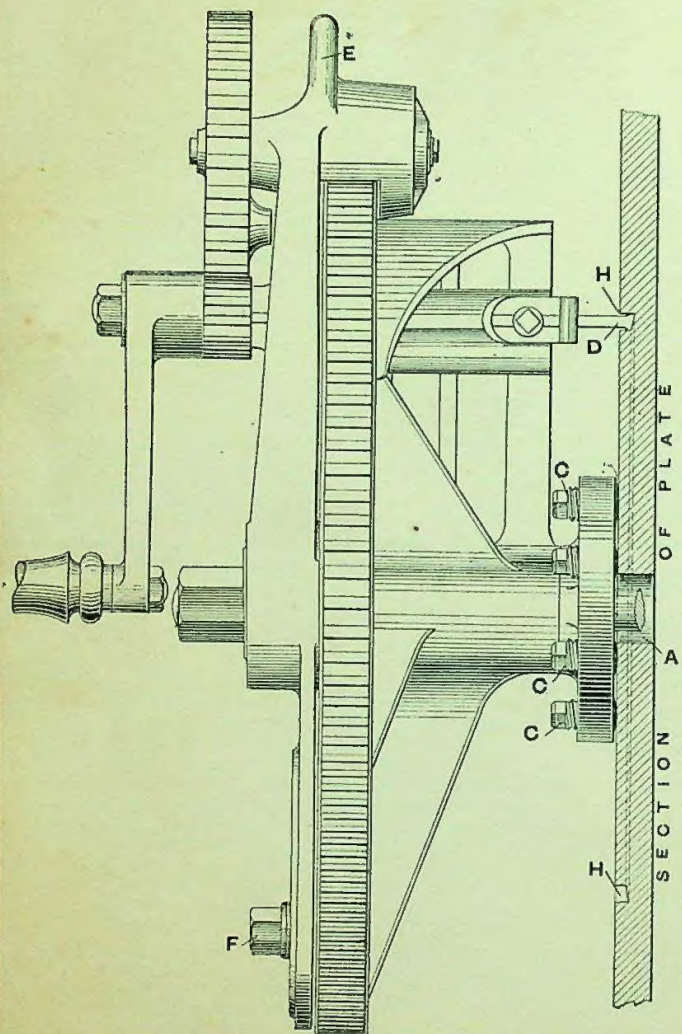


FIG. 1.—END ELEVATION.

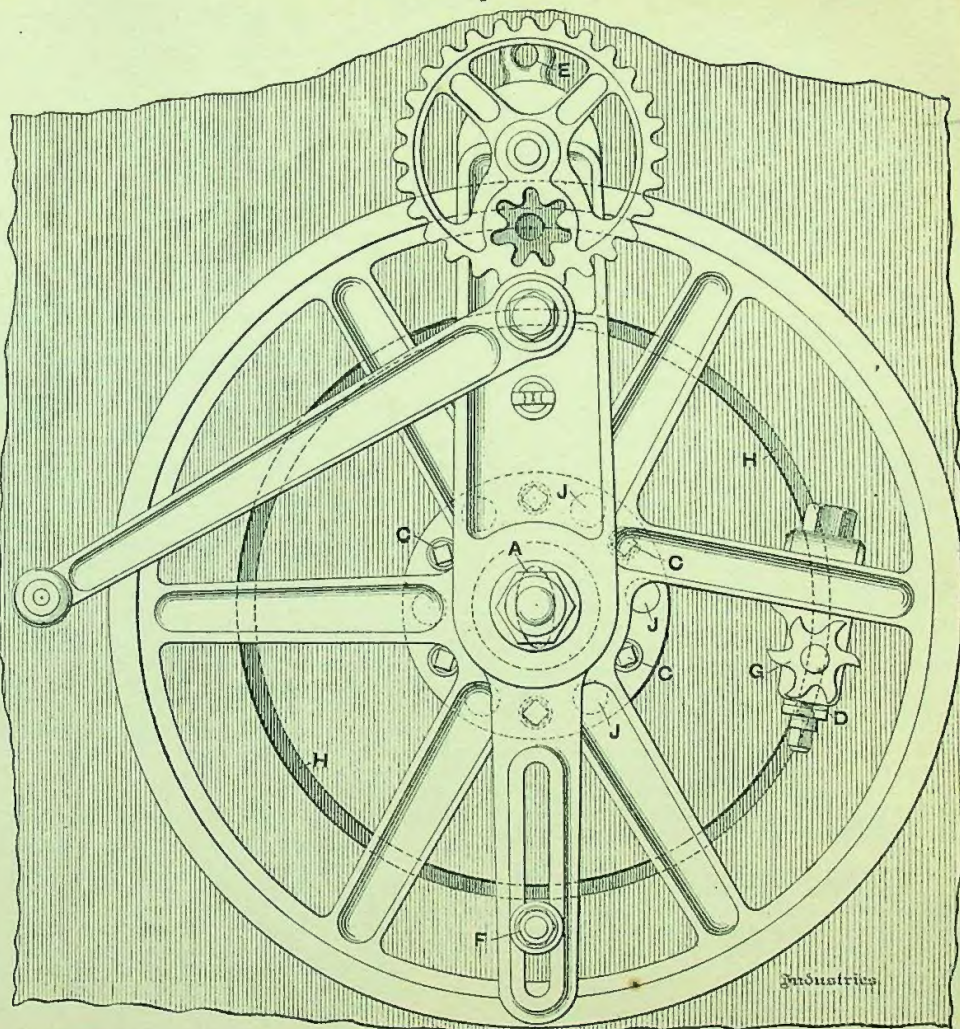


FIG. 2.—FRONT ELEVATION.

SMILES' HOLE CUTTING MACHINE.

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MR. GEORGE THWAITES, of Stockton-on-Tees, exhibited at the late Newcastle Exhibition Smiles' patent hole cutting machine, shown in the above illustrations. The advantage claimed for this machine is that holes may be cut into the shell plates of a vessel by machinery after they are put in position, whereas formerly, especially in cases where sufficiently powerful hydraulic or steam machinery is not available for cutting or punching out the holes, the perforations had to be cut before fixing the plates in position. Special machinery for punching large holes does not appear to be economical, as time is lost in moving plates from one machine to another, and the first cost and maintenance of large hydraulic punching machinery is considerable. In order to overcome these disadvantages, Mr. Smiles designed the above hole cutting machine. It is made in three sizes, and our illustrations show the intermediate size, which is capable of cutting holes from $6\frac{1}{2}$ in. to $15\frac{1}{2}$ in. diam. The smaller size cuts holes from 4 in. to 9 in. diam., and the larger one holes from 8 in. to $21\frac{1}{2}$ in. diam. These machines have been designed with a special view to lightness, while insuring strength and rigidity—steel and malleable iron being solely used in their construction. Fig. 1 shows an end elevation of the machine attached to a plate. A small oval perforation A is made in the centre of the proposed position of the hole, and an oval headed bolt inserted from the outside of the plate, and turned through 90° before screwing up. In some shipbuilding yards where the machine has been used, the hole for inserting the central bolt has been punched out at the same time as the rivet holes. If it be convenient to insert the central bolt from the inside of the vessel, the hole need not be oval. In cases where the plate is curved the machine is set by means of set screws C. The tool D lasts a considerable time, and may be easily replaced when worn out. An eye E is provided for attaching a rope for slinging the machine over the ship's side. In Fig. 2 a front elevation of the machine is shown attached to a plate. The pin F moves the star wheel G, thereby feeding the tool D. JJ are tempered steel claws, which grip the plate so as to prevent the machine from turning round the central bolt.